REMARKS

In response to the Examiner's Office Action dated December 19, 2008, Applicant submits the following remarks.

Applicant and the Examiner appear to have reached agreement regarding the scope of the claims presented herein. Specifically, the two independent claims herein are directed to management of memory buffers in "trick play" digital video decoding, i.e., modes in which "frames of digital video are displayed in other than their original order" (see claim 1) or, more particularly, a "reverse order" (see claim 13).

Within the context of this "trick play" mode of operation, the claims describe a method of selecting decode and display buffers for decoding in which intra-coded (I) frames, predicted (P) frames and bidirectionally coded (B) frames are all decoded according to the stated methodology. In claim 1, the decode buffer is selected "without regard to a current playback mode or type of video frame being decoded." Claim 13 recites a method of managing memory that decodes frames in a "forward order" until frame buffers are "respectively storing first and second prior video frames preceding said current video frame in forward order". Then the prior frames are displayed without re-decoding.

The Examiner has applied the Comer patent, 6,201,927 in rejecting claims. Although Comer describes a reverse playback mode, as stated in Comer col. 2 line 66, col. 3, line 12, col. 3 line 54, and col. 10 line 53, those sections describe a "three times speed" reverse playback, and it may be seen that in this operation only the "I" and "P" reference frames of an MPEG group of pictures are decoded. There is also, at col. 12, line 32, a discussion of a "six times play speed" reverse playback mode in which fewer "I" and "P" frames, but still no "B" frames, are decoded.

The Examiner has noted text in Comer at col. 10, lines 33-67, regarding the existence of decoders for decoding B-frames quickly. The Examiner is asserting that this text discloses decoding of B-frames in a reverse playback mode. With due respect, the Examiner is incorrect. In fact, what Comer is stating in this passage is that because known decoder hardware is fast enough to decode a entire B frame the display time of a video field, and given that decoding B frames is more complex than decoding I or P frames, known decoder hardware should be fast enough to decode entire I or P frames in the display time of a video field. This is a necessary precursor to the Comer's assumption that it is possible to accomplish reverse playback using only I or P frames – the reverse playback mode that is clearly identified throughout Comer's text and figures. Notably, within the text quoted by the Examiner (col. 10 lines 59-60) it is explicitly stated that "[i]n this example only I frames and P frames are decoded.....".

Thus, while the Examiner asserts that Comer shows the decoding of B frames in reverse playback, there is in fact no such disclosure.

Applicant will now turn to Schultz, which indicates at col. 5 lines 17-23, that B-frames can be stored during trick play. Schultz notes that "[t]o smoothly portray scene motion requires the decoding and display of I, P, and possibly B-frames", and further states at col. 10, lines 48-65 that "[o]peration in reverse at play speed requires the reproduction of B-frames and in a further trick mode optimization reverse mode operation is advantageously simplified in terms of buffer memory requirements by reversing the order in which adjacent B pictures are decoded. This advantageous reversal of decoding order is achieved by setting or controlling the memory start pointers to enable decoding of specific pictures required by the trick mode. ... Memory size and control may be further optimized during trick play by advantageously enabling multiple decoding of pictures either immediately or as specifically required by the trick play algorithm. The provision of these advantageous features requires careful control of read/write functions and the synchronization therebetween."

Thus, as Applicant has previously stated, the art of record includes Comer, which does not disclose decoding B frames in a reverse playback mode, and Schultz, which discusses decoding B frames in reverse playback but with a particular approach, as quoted above. Considering this disclosure in Schultz, combined with Comer, Applicant again submits that the Examiner cannot produce the claimed invention, for the reasons articulated in Applicant's prior response, namely:

Claim 1, and those claims that depend therefrom, recite a method in which the decode buffer that will store decoded digital video is selected "without regard to a current playback mode or type of video frame being decoded." That is, the algorithm for selection of a buffer is independent of the type of playback or type of frame. This is in direct opposition to the Schultz discussion quoted above, in which reverse play involves order reversals, controlling memory start pointers and, most on point, "careful control of read/write functions and the synchronization therebetween". Schultz thus clearly teaches that special handling is to be applied for reverse play modes, specifically including manipulation of memory start pointers and read/write functions and synchronization. It cannot be said that Schultz discloses a method in which memory buffering is performed "without regard to a current playback mode or type of video frame being decoded", as claimed. As Schultz is the only citation for disclosure of a method for decoding B-frames in a reverse order, the combination of Schultz and Comer falls short of suggesting the invention as claimed.

With regard to claim 13, decoding of frames in a "forward order" until frame buffers are "respectively storing first and second prior video frames preceding said current video frame in forward order", is not found in the art cited. Indeed, in direct opposition, Schultz asserts that reverse play should proceed by "reversing the order in which adjacent B pictures are decoded." Thus, rather than decoding in forward order, Schultz is suggesting the opposite, decoding in a reversed order. This disclosure is this completely inconsistent with what is recited by claim 13. Here again, as Schultz is the only citation for disclosure of a method for decoding B-frames in a reverse order, the combination of Schultz and Comer falls short of suggesting the invention as claimed.

Applicant thus re-submits that the independent claims as presented distinguish the Comer reference, which is the only reference cited against those claims, and thus all claims are allowable.

Applicant is of the opinion that a two-month extension of time, which is hereby requested, is due as a result of this Amendment. Payment of all charges due for this filing is made on the attached Electronic Fee Sheet. If any additional charges or credits are necessary to complete this communication, please apply them to Deposit Account No. 23-3000.

CONCLUSION

It is believed that no fee is due for this filing. If any fee is deemed due, consider this as an authorization to charge Deposit Account 23-3000.

Respectfully submitted,
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